the controller measures a phase difference between the output of the pilot extractor and channel estimator at frequencies n and n + Δn, where n is tone frequency and Δn is a frequency spacing between adjacent tones,

wherein the controller controls the first phase rotator as a function of the phase difference between the output of the pilot extractor and the channel estimator at times k and k + Δk; and

wherein the controller controls the second phase rotator as a function of the phase difference between the output of the pilot extractor and the channel estimator at frequencies n and n + Δn.

7. (Currently amended) The apparatus of claim 1, wherein:

the first phase rotator phase rotates the output of the initial time and frequency synchronizer by $\exp(-j2k\theta_T)$, where k is ~~the~~ time and θ_T is a first output from the controller; and

the second phase rotator phase rotates the ~~an~~ output of the fast Fourier transformer for output to the pilot extractor and channel estimator by $\exp(-j2n\theta_F)$, where n is ~~the~~ tone frequency and θ_F is a second output from the controller.

8. (Currently amended) A method of synchronization for use in a pilot assisted channel estimation orthogonal frequency multiplexing system, the method comprising the steps of:

receiving a signal containing pilot symbols;

setting time and frequency parameters as a function of the signal so as to provide an initial time and frequency synchronization;

phase rotating the signal across time;

transforming the ~~signal~~ phase rotated signal ~~across time~~ with a fast Fourier transformation;

phase rotating the transformed signal across frequency; and

extracting the pilot symbols and generating a channel estimate from the signal after the signal has been phase rotated across frequency,

wherein the phase rotating across time and the phase rotating across frequency are controlled as a function of the channel estimate.

21. (Currently amended) The system of claim 17, wherein the initial synchronization means uses ~~discreet~~ discrete initial timing and frequency offsets.

22. (Currently amended) The system of claim 17, wherein:

the controlling means measures a phase difference between an output of the extracting and estimating means at times k and k + Δk, where k is time and Δk is a symbol period; and

the controlling means measures a phase difference between the output of the extracting and estimating means at frequencies n and n + Δn, where n is tone frequency and Δn is a frequency spacing between adjacent tones.

23. (Currently amended) The system of claim 17, wherein:

the first phase rotation is by $\exp(-j2k\theta_T)$, where k is time and θ_T is set by the controlling means; and

the second phase rotation is by $\exp(-j2n\theta_F)$, where n is ~~the~~ tone frequency and θ_F is set by the controlling means.

24. (Currently amended) A computer program in a computer readable ~~form~~ medium for causing a processor executing the program to synchronize the sub-components of a received signal to each other, the program comprising:

a module for initially synchronizing a Signal ~~pilot~~ containing pilot symbols ~~signal~~ so as to provide an initial time and frequency synchronization;

a module for phase rotating the signal across time;

a module for transforming the ~~signal~~ phase rotated Signal ~~across time~~ with a fast Fourier transformation;

a module for phase rotating the transformed signal across frequency; and

a module for extracting the ~~the~~ pilot symbols and generating a channel estimate from the signal after the signal has been phase rotated across frequency,

wherein the module for phase rotating across time and the module for phase rotating across frequency are responsive to the ~~channel~~ module for extracting the pilot symbols and ~~estimating~~ generating the channel estimate.

25. (Currently amended) The program of claim 24, wherein the initially synchronizing the signal containing pilot symbols so as to provide ~~an~~ the initial time and frequency synchronization synchronizes the signal containing the pilot symbols such that intercarrier interference effects and intersymbol interference effects are negligible.

26. (Currently amended) The program of claim 24, wherein the signal ~~containing pilot symbols~~ has plural carrier frequencies.

27. (Currently amended) The program of claim 24, wherein the synchronizing of the sub-components of the received signal to each other, by the processor ~~loaded with a~~ executing the program, occurs in real time.

28. (Currently amended) The program of claim 24, wherein initial synchronization uses ~~discreet~~ discrete initial timing and frequency offsets.

29. (Currently amended) The program of claim 24, wherein:

the phase rotating across time is controlled as a function of ~~the with the channel estimate is controlled as a function of~~ a calculated phase difference between ~~the~~ channel ~~estimator~~ estimates at times k and k + Δk, where k is time and Δk is a symbol period; and

the phase rotating across frequency is controlled as a function of ~~the channel estimate is controlled as a function of~~ a calculated phase difference between ~~the~~ channel ~~estimator~~ estimates at frequencies n and n + Δn, where n is tone frequency and Δn is a frequency spacing between adjacent tones.

30. (Currently amended) The program of claim 24, wherein: